

A CONTRIBUTION TO THE STUDY OF EPILEPSY.

By FRANK H. INGRAM, M. D.

Pathologist the N. Y. City Asylums for the Insane; Visiting Physician to the Hospital for Nervous Diseases.

IN observing a large number of cases of epilepsy for a long period, one is necessarily impressed by the various phases which the disease manifests in one person, and by the difference in the character and in the sequence of the convulsive phenomena in different persons. Viewed from a purely clinical stand-point, it would seem a comparatively easy matter to so group the cases that a series of types of epilepsy could be definitely formed, and an instructive lesson in treatment and prognosis be acquired. It was with the hope of establishing some basis for the selection of cases for treatment that the observations on which this paper is founded were made. The results of months of patient work was far from gratifying in many respects, but sufficient information was gained to justify the trouble expended.

In the cases herewith presented, the time during which observations were made and recorded varied from eight months to several years. Ninety of these cases were so located that they could be conveniently grouped for statistical purposes and comparison, while the others were selected for the special features of their disease. I am indebted to Dr. Charles C. Flint, of Lenox, Mass., for the compilation of the table showing daily movement in ninety cases during a period of eight months. This time really represented a year, for in the four months remaining nothing of an exceptional nature occurred to qualify the record. The disease had been established for not less than one year in any case, and in a few cases it had existed upwards of twenty years.

During the period mentioned, 110 epileptics had a few more than 11,000 distinct epileptic seizures. These were,

in the main, well defined convulsions; a few were vertiginous attacks of mild form, without spasms of the limbs; others were pure motor explosions of a non-convulsive type. A good majority of these seizures occurred during the day, as will be seen by reference to the following record of ninety cases:

Month.	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.	Total.
Diurnal.....	738	1042	866	726	793	956	843	886	5750
Nocturnal....	530	855	475	501	502	444	352	447	4106
Total.....	1268	1897	1141	1227	1295	1400	1193	1333	9856

Here we have a total of 9,856 epileptic seizures occurring during a period of eight months. Within this time, five of the patients died or were discharged from care, so that at all times there was an average of eighty-five under observation. It will be noticed that the monthly average was 1,232, 718.75 diurnal, and 513.25 nocturnal seizures; for each patient, 14.495, 8.547 diurnal, and 6.038 nocturnal. In June the average was much higher, being 22.31+ for each patient, 12.25+ diurnal, and 10.05+ nocturnal; and the difference between the diurnal and nocturnal seizures was less than in any other month. It is an interesting fact that during this month there were many marked thermometric and barometric changes: hot days would be followed by exceptionally cold nights, and the transitions from dry to wet weather were remarkable. It seems that these atmospheric variations must have had a prominent influence in producing the excess of convulsions; and in the only other month in which the number of seizures was above the average, namely, October, there was one week of similar conditions. Sudden barometric changes invariably caused an increase in the number of convulsions, and before and after a thunder storm this was excessive. Changes of temperature did not exert such a marked influence.

The excess of diurnal over nocturnal fits may be accounted for by the fact that at night many causes of excite-

ment are absent. The external influences which affect the emotions are wanting, and the repose of the body is unfavorable to the development of motor spasms. With the exception of the one month in which the many nocturnal seizures were charged to the account of atmospheric influences, undigested food, retained urine, and bad dreams were I believe, responsible for a vast majority of the fits. I have frequently noticed that a convulsion coming closely upon the evening meal, the patient being soon put in bed, would be followed by one or more convulsions during the night; and, in such cases, it was a convenient inference that the first explosion retarded gastric digestion and that the presence of food in the stomach was sufficiently irritating to renew the spasms.

With the urine of several hours of excretion in the bladder, a fit at the time of, or soon after, retiring, would be followed by others before the night had passed. In the same cases, when the urine had been voided before the fit, a tranquil repose would, as a rule, mark the night.

Disturbing dreams were not impotent so far as the seizures were concerned. It was often observed that a patient would awaken with a start, and almost immediately after have a well defined convulsion. In these instances the circumstances were such as to exclude the probability that the startled awakening from sleep was the beginning of the epileptic seizure. With the more demented patients, constipation and retention of urine were habitual, so that two exciting causes of convulsion were ever present.

The aura epileptica was defined in less than one-half of the cases under observation. More frequently the fit was sudden and ushered in by loss of consciousness, the spasms of the limbs following after an appreciable interval.

The stage of convulsion varied in duration from thirty seconds to as many minutes. The greatest violence was, as a rule, manifested at the middle of the attack, although sometimes most prominent at the beginning, or at the termination, of the spasms.

The periods of coma or stupor lasted from a few minutes to several hours. Occasionally there would be a series of

apparently voluntary, but decidedly irrational, acts before consciousness was regained. This is well illustrated in two cases, as follows:

A man, twenty-five years of age, had had epileptic seizures with varying frequency during a period of ten or eleven years. As a boy of from thirteen to fifteen years, he masturbated almost incessantly, not because of a developing sexual desire, but for the reason that there was a peculiar irritation of the genitals, which was relieved only by friction of the parts. His foreskin was long and adherent, and circumcision was performed, with some benefit to the sufferer. The epileptic seizures in this case were of the ordinary kind up the time of emergence from stupor. At the period when consciousness should have returned, this man would arise from where he had been placed, would wash his face and hands and carefully adjust his disordered garments, then, with gravity of countenance and dignity of demeanor, perform ludicrous but pitiable acts. He would disarrange the furniture and ornaments of his room, or would urinate in a vase or between the matresses of his own or a fellow-patient's bed. His appearance indicated consciousness, but he had no recollection of these acts, and a careful observation of the case demonstrated that he was not conscious when performing them. Some months this patient would have five or ten fits and fifteen or twenty nocturnal emissions of semen; again, this order would be reversed. There was ever a definite relation between the fits and the emissions, and the latter probably represented localized epileptic spasms.

The second patient of this class, a man twenty-one years of age, had had epilepsy for eight years. His seizures consisted of, in the order named, stupor, rolling of the body from side to side, with mild spasms of the limbs; somnolence; extreme terror, accompanied by violence in action; exhaustion and gradual return of consciousness. During the period of terror, he would run at highest speed for a mile or two miles, vaulting fences and other obstructions with an unnatural and surprising agility; or he would expend his violence in tearing boards from their fastenings

or in chopping wood with an axe. The stage of exhaustion would last ten or fifteen minutes, during which the patient would stagger about in a feeble way, or he would seat himself or lie down in some convenient place. Consciousness returned slowly.

Another case, in some respects similar to the two just described, was an unmarried woman, twenty-five years of age. Frequently she would have the most common form of epileptic seizure, but fully as often her disease would be manifested in unconscious acts of extreme violence, without convulsions, which would be succeeded by somnolence or stupor. She did not remember what had occurred during her paroxysms of violence.

A case deserving at least a passing notice was a woman thirty-eight years of age. Her epilepsy consisted of infrequent nocturnal convulsions, always attributable to an undigested supper, and of frequent attacks of *petit mal* or vertigo. The vertiginous attack was a simple, momentary loss of consciousness; the other form of seizure consisted of loss of consciousness, accompanied by incoherent mutterings, which would last from thirty seconds to three minutes. In these there would be apparently but a suspension of continuity of mental action, for, no matter whether, at the onset, the patient had been reading, knitting or engaged in conversation, with the return of consciousness the train of thought would be taken up at the broken point and carried out in orderly sequence. This one feature, of itself, makes a conspicuous departure from the usual form of attack of *petit mal*. This patient was anaemic and suffered from constipation and hemorrhoids. Tonic treatment and ligation of the piles caused a most marked improvement, but a cure was not effected. In this case there was a partial amnesia, which, in degree, was disproportionately more severe than the fits.

The most peculiar character of convulsion witnessed in any case was a combination of almost every conceivable motion of the body and limbs. After a cry and a twisting of the body, the patient, a woman, twenty-three years of age, would fall to the floor; the top of the head would be

fixed as a pivot; the body would rotate and, at the same time, describe a circle with its length as the radius; the limbs would engage in a series of clonic convulsions of greatest severity, and the fit would terminate in a tonic rigidity of all the muscles, which would be followed by relaxation and stupor. Exhaustion was not as marked in this case as might have been expected, considering the violence of the explosion, and the mind cleared quickly.

I have the records of three autopsies in which the changes in the brain would fully account for the epileptic convulsions. These are given with such parts of the histories of the cases as are pertinent.

CASE I.—A woman, forty-five years of age, had been afflicted with epilepsy for more than ten years. The seizures were frequent, often as many as six occurring in a day. Towards the end of life the fits were most severe, and death occurred from exhaustion a short time after emergence from the epileptic state. The fits were invariably of a kind: spasms of the left leg, spasms of the arm of the same side, loss of consciousness and convulsions of the limbs of both sides. For a short period after each fit, the left side appeared weaker than the right side.

The mental state of this woman had a history not uncommon in epilepsy. Some three years after the development of the disease, she manifested considerable irritability and had frequent outbursts of marked excitement. Eventually the excited periods increased and a well-defined mania developed. Paroxysms of violence were frequent and delusions were wanting. As years passed, excitement was less marked and the mind became sluggish, but dementia was not complete.

The post-mortem examination showed a poorly nourished body. The heart-walls were thin and the ventricles dilated, but there was no evidence of disease of the lungs or of the abdominal viscera. In the right hemisphere of the brain, the subcortical vessels of the "leg-centre" were dilated and tortuous, presenting the appearance of multiple aneurisms. This condition, so much in keeping with that of the heart, was found in no other part of the brain, and it will, I believe, fully account for the peculiar character, as well as for the existence, of the convulsions.

CASE II.—A man, thirty-two years of age, was suddenly seized with loss of consciousness and paralysis of the left side of the face and body. The recovery from the hemiplegia was rapid, but there was a subsequent deafness and a paresis of the face and tongue on the left side, and epilepsy soon developed. The convulsions always began, were more violent and of longer duration on the left side. Death terminated the disease, after twenty-four hours of convulsions and coma, in the fourth year.

The post-mortem examination of the brain showed deposits of caseous matter, in the form of granules, in the sheath of each auditory nerve and between the skull and dura and between the dura and pia, in the right Rolandic region. The pia was, in this area, fixed to the brain by fibrinous and caseous matter, and the blood vessels were coated with similar substances. There was a slight cortical degeneration, probably a softening caused by pressure of the deposits, but the other parts of the brain were normal.

CASE III.—The history of this case is unimportant, excepting that the convulsions were synchronous on the two sides of the body. The autopsy revealed an area of degeneration in the posterior horn of each lateral ventricle. This is the only case in my experience, although much care has been taken in many examinations, in which there was an indication of lesion in the so-called epileptogenic zone.

When we view epilepsy in its various phases, observe the many ways in which it manifests itself as to the character of the convulsions, and note the different findings in *post mortem* examinations of the brain, it would not be reasonable to expect to discover a definite pathology for this disease. Cortical and ventricular degenerations, various kinds of deposits, varicose and aneurismal vessels will be found singly or in combination. Various kinds of disorders of nutrition and vascular weaknesses are frequently the only apparent defects in cases of epilepsy. Psychic influences are most potent in generating the explosions.

In conclusion, a few words in regard to the treatment of epilepsy. The patients of whom I have written have been under medical care at all times, some in hospitals and others at home. About one-half took bromides; the remaining ones took various other drugs. The bromides in some instance greatly reduced the number of convulsions,

but nitro-glycerine, iron, digitalis, and other drugs did almost as much good. The bromides seemed especially adapted to some cases, but their ultimate effects were frequently so undesirable as to materially affect the value of the drug.

The tendency of epilepsy is toward dementia, more or less complete. It would, therefore, seem fitting that the physician should select remedies which will correct any functional disturbance in the circulatory, digestive or urinary systems, and that he should avoid, unless particularly indicated or absolutely demanded, those restraining remedies which, long continued, impoverish the blood and hasten mental degeneracy.

ANTIPYRIN IN ANGINA PECTORIS.

The "Epitome" (Dec., 1889) notes the good effects of this remedy in severe angina pectoris. The patient was brought into the ward unconscious, morphine and trinitrine having been administered. When Dr. E. D. Martin (New Orleans) first saw him, he was undergoing much agonizing pain, that five drops of nitrite of amyl (by inhalation) magically relieved. Large doses of antipyrin and digitalis were ordered three times daily, with a view of diminishing the reflex functions. On the third day the antipyrin was stopped; but on the fourth pain returned, and the same treatment was again employed for ten days, with flattering results. A striking feature of the report is the patient's own intelligent history of the case, the procedure instituted by Dr. Martin for his relief corresponding exactly to his own method of diminishing torture and one that he had followed for five years. Earlier, he had used chloral during, and bromide of potassium after, the attack. There existed strong hereditary predisposition to angina pectoris, all of the patient's family suffering more or less from the same trouble.

L. F. B.